

A Brief Overview of the: Proposed Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards

Public Outreach Presentation
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U.S. Environmental Protection Agency
Office of Air Quality Planning and
Standards
Research Triangle Park, NC

Purpose

- ▶ Today's webinar is part of EPA's overall outreach strategy to stakeholders; today, we will:
 - ▶ Provide background information on the rulemaking process
 - ▶ Inform the public on Proposed Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards that were signed by the Administrator on May 15, 2014. Describe how written comments can be submitted to the docket.
- ▶ **Note:** This webinar is intended to be an educational overview of the proposal and does not cover all of the proposal details. We will **not** be taking comments on the rule during this webinar. Please refer back to the proposal when crafting your written comments.

Overview

- ▶ Clean Air Act Requirements
- ▶ Overview of the Refinery Source Category
- ▶ Refineries Emit a Wide Range of Pollutants
- ▶ Health Effects of Specific Pollutants
- ▶ HAP emitted with Existing Controls in Place
- ▶ Past Rulemakings on the Refining Source Category
- ▶ Overview of Proposed Rule
- ▶ Proposed Amendments
- ▶ What Does a Residual Risk Analysis Show?
- ▶ What is Environmental Justice?
- ▶ Demographic Analyses
- ▶ How to Submit Comments to the Docket
 - What Happens After I Comment?
- ▶ Q and A

Clean Air Act Requirements

▶ **New Source Performance Standards (NSPS)**

- ▶ CAA section 111(b) requires EPA to set and periodically review, emission standards for new sources of criteria air pollutants (CAP), volatile organic compounds (VOC) and other pollutants

▶ **Maximum Achievable Control Technology (MACT)**

- ▶ CAA section 112 requires EPA to:
 - Set emission standards for toxic air pollutants from stationary sources reflecting the maximum achievable control technology (MACT) based on the best performing facilities in an industry
 - Conduct residual risk and technology reviews (RTR) of these MACT standards



Clean Air Act Requirements (cont.)

- ▶ EPA is required to conduct two reviews and update the existing standards, if necessary
 - **Residual Risk Assessment:** To determine whether additional emission reductions are warranted to protect public health or the environment; this is a one-time requirement
 - **Technology Reviews:** To determine if better emission control approaches, practices or processes are now available; required every eight years

Overview of Refinery Source Category

- ▶ There are currently 142 large (major sources) and 7 small (area source) petroleum refineries in the United States
- ▶ There are 36 small businesses that own petroleum refineries
- ▶ Refineries are responsible for 20,000 tons per year hazardous air pollutant (HAP) emissions
- ▶ In 2011 EPA completed first-ever comprehensive information collection request
- ▶ This proposed rulemaking includes both MACT and NSPS standards
 - Risk and Technology Review (RTR) for MACT CC and MACT UUU
 - Technical corrections to NSPS Ja resulting from issues raised by API



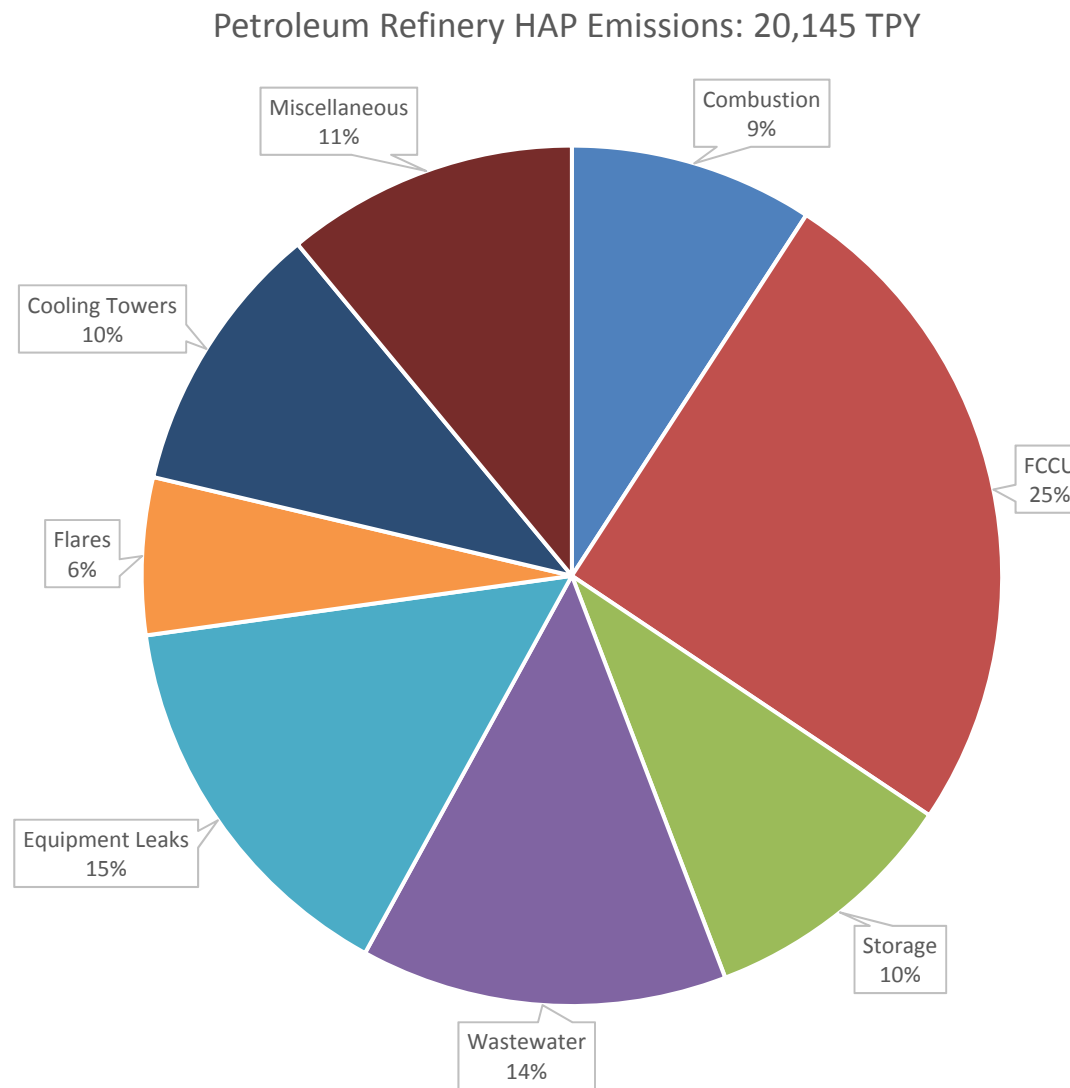
Refineries Emit a Wide Range of Pollutants

- ▶ Criteria Air Pollutants (CAP)
 - ▶ Sulfur dioxide SO_2
 - ▶ Oxides of Nitrogen NO_x
 - ▶ Carbon Monoxide CO
 - ▶ Particulate Matter (PM)
- ▶ Volatile Organic Compounds (VOC)
 - ▶ Organic compounds that are photochemically reactive
- ▶ Hazardous Air Pollutants (HAP)
 - ▶ Carcinogenic HAP, including benzene, naphthalene, 1,3-butadiene, polycyclic aromatic hydrocarbons (PAH)
 - ▶ Non-carcinogenic HAP, including hydrogen fluoride (HF) and hydrogen cyanide (HCN)
 - ▶ Persistent bioaccumulative HAP, including mercury
- ▶ Other Pollutants
 - ▶ Greenhouse gases (GHG)
 - ▶ Hydrogen sulfide (H_2S)

Health Effects of Specific Pollutants

Compound	Acute	Chronic
Benzene	Neurological effects, irritation of the eye, skin and respiratory tract	Blood disorders (reduced number of red blood cells and aplastic anemia), cancer
PAHs	Skin disorders, depression of the immune system	Skin disorders (dermatitis, photosensitization), depression of the immune system, damage to the respiratory tract, cataracts, cancer
Nickel	Damage to the lungs and kidneys, gastrointestinal distress, disfunction of the immune system	Dermatitis, asthma like syndrome, decreased lung function, disfunction of immune system, cancer
Hydrogen Cyanide	Eye irritation, headaches, confusion, gastrointestinal distress, death	Eye irritation, headaches, fatigue, chest pains, nosebleeds

How much HAP do these sources emit with existing controls in place?



Past Rulemakings On the Refinery Sector

NSPS

- ▶ 1974 NSPS – covers fuel gas combustion devices, FCCU and sulfur plants
- ▶ 2008 and 2012 NSPS – covers same above and delayed cokers, flares and process heaters specifically

MACT

- ▶ Promulgated 2 MACT standards for refineries
 - ▶ 1995 MACT (known as MACT 1) covers non-combustion or evaporative sources, such as equipment leaks, tanks, wastewater, miscellaneous process vents; amended to cover heat exchange systems, including cooling towers
 - ▶ 2002 MACT (known as MACT 2) covers combustion sources: catalytic cracking units, catalytic reforming units and sulfur recovery units

Risk and Technology Review (RTR)

- ▶ 2007 – proposed risk and technology review amendments for non-combustion sources
- ▶ 2009 – withdrew amendments related to risk review due to insufficient data; amendments promulgated for heat exchanger systems and amended in 2013

Overview of Proposed Rule

- ▶ The EPA is proposing:
 - ▶ Emission control requirements for storage tanks, flares and coking units at petroleum refineries
 - ▶ Monitoring of air concentrations at the fenceline of refinery facilities to ensure proposed standards are being met
 - ▶ To eliminate exemptions to emission limits during periods of startup, shutdown and malfunction
 - ▶ Technical corrections and clarifications to the 2008 Petroleum Refinery New Source Performance Standards

Proposed Amendments

- ▶ Flares: Require monitoring and control of flare combustion zone composition to:
 - Account for over-steaming and excess aeration
 - Supplement waste gas with fuel, if necessary
 - Ensure that gases routed to flares are combusted

- ▶ Storage Tanks: Upgrade storage tank controls and lower applicability thresholds
 - Upgrade roof deck fitting controls (gasketed covers for roof openings, sleeve and wipers for guide poles)
 - Require control of tanks >20,000 gal and >1.9 psi or >40,000 gallons and >.75 psi
 - Reference Part 63 Subpart WW and SS (standard standards)

- ▶ Delayed Cokers: Do not allow emissions to the atmosphere from the steam vent until the drum pressure is below 2 psig (pounds per square inch gauge)

Proposed Amendments

- ▶ Fenceline Monitoring:
 - ▶ Deploy passive monitors surrounding the refinery at the fenceline
 - ▶ Using 2 week average concentration readings, calculate annual average benzene concentration and compare against action level
 - ▶ Conduct root cause analysis and corrective action upon exceedances of the action level; 9 ug/m³
- ▶ Startup, Shutdown and Malfunction (SSM)
 - ▶ Propose to remove SSM exemptions and add limits for certain sources during startup and shutdown
 - ▶ Bypasses and discharges through pressure relief devices are a violation of standard; requirements to monitor discharges via direct monitoring or monitoring of operating conditions

What Does a Residual Risk Analysis Show?

- ▶ Risk deemed to be “acceptable” under 112(f)
- ▶ Highest maximum individual risk (MIR) is estimated at 60 in a million (actuals) and 100 in a million (allowables)
- ▶ Sector-wide population at risk greater than 1 in 1 million is predicted at 5,000,000; Highest MIR driven by equipment leaks from naphthalene and benzene; cancer incidence of 0.3 cases/year driven by delayed cokers (DCU) and PAHs
- ▶ Analysis estimates that maximum HI of 0.9 from HCN from FCCU
- ▶ Maximum acute non-cancer risk predicted a hazard quotient (HQ) of 5 due to emissions of nickel from fluid catalytic crackers (FCCU)
- ▶ Analysis estimates that proposed amendments for DCU and storage tanks would lower population at risk to 4,000,000, and reduce incidence about 18%

What Is Environmental Justice?

- ▶ EPA defines Environmental Justice (EJ) as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies”
- ▶ Executive Order ***Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*** [E.O. 12898] was signed by President Clinton on February 16, 1994, and calls for federal agencies ***“to the greatest extent practicable and permitted by law, to identify . . . and address . . . as appropriate, disproportionately high and adverse human health or environmental effects of agency programs, policies and actions on minority populations and low income populations”***



Demographic Analyses

- ▶ To determine potential EJ issues, demographic analyses of the minority, low-income and indigenous populations were conducted
- ▶ Percentages of different social, demographic and economic groups within populations living near facilities were compared with total percentages of demographic groups nationwide

Demographic Analysis (cont.)

	Nationwide	Population with Cancer Risk at or Above 1-in-1 Million (pre-controls)	Population with Cancer Risk at or Above 1-in-1 Million (post controls)
Total Population	312,861,265	5,204,234	3,765,225
Race by Percent			
White	72	50	49
All Other Races	28	50	51
Race by Percent			
White	72	50	49
African American	13	28	31
Native American	1	1	1
Other and Multiracial	14	21	19
Ethnicity by Percent			
Hispanic	17	29	24
Non-Hispanic	83	71	76
Income by Percent			
Below Poverty Level	14	21	14
Above Poverty Level	86	79	86
Education by Percent			
Over 25 and without High School Diploma	15	23	23
Over 25 and with a High School Diploma	85	77	77

*There is no population with a Chronic Hazard Index above 1

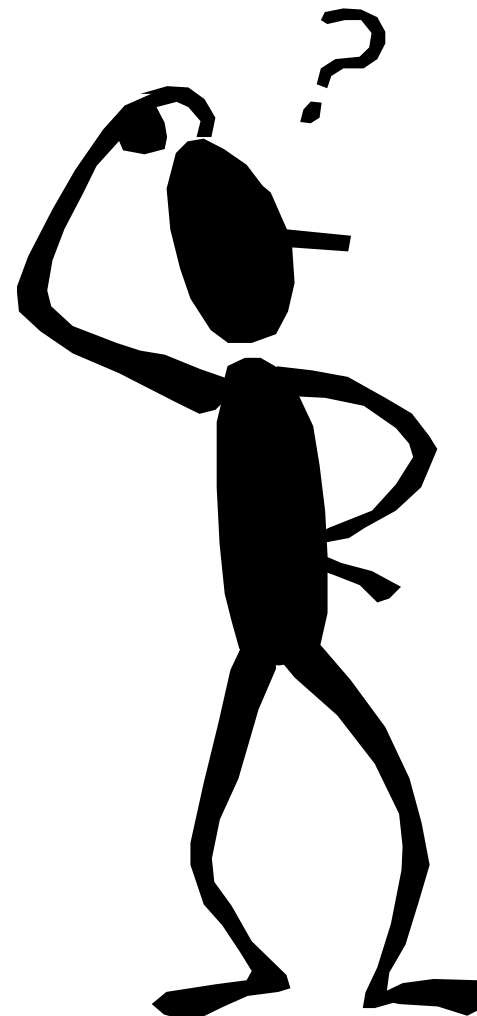
How to Submit Comments to the Docket

- ▶ EPA will accept comment on the proposal for 60 days after publication in the [Federal Register](#). Comments, identified by Docket ID No. EPA-HQ-OAR-2010-0682, may be submitted by one of the following methods:
 - ▶ Federal eRulemaking Portal: <http://www.regulations.gov> - follow the online instructions for submitting comments.
 - ▶ Email: A-and-R-Docket@epa.gov - include docket ID No. EPA-HQ-OAR-2010-0682 in the subject line of the message.
 - ▶ Fax: (202) 566-9744.
 - ▶ Mail: Send your comments to:
 - Environmental Protection Agency
EPA Docket Center (EPA/DC), Mailcode 28221T
Attention Docket ID No. EPA-HQ-OAR-2010-0682
1200 Pennsylvania Avenue, NW. Washington, DC 20460
 - ▶ Express mail, commercial delivery, hand delivery or courier: Such deliveries are only accepted during the docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information. Deliver your comments to:
 - EPA Docket Center, Room 3334
EPA WJC West Building
1301 Constitution Avenue, NW.
Washington, DC 20004



What Happens After I Comment?

- ▶ After the comment period closes, EPA will review every comment that was submitted on time
- ▶ Taking those comments into consideration, EPA will begin to develop the final rule (per a court order, the final rule needs to be signed by the EPA Administrator by April 17, 2015)
- ▶ EPA will prepare a “**Response to Comments**” document that describes how our final rule either:
 - ▶ Takes the comment into account or
 - ▶ States why we were unable to take the comment into account
- ▶ For more information
 - ▶ Contact Brenda Shine of EPA's Office of Air Quality Planning and Standards at (919) 541-3608 or at shine.brenda@epa.gov



Q&A
